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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/841,698 | 04/24/2001 | Galina Troyanova | IMC-41U | 4398 |
| 7590 | 03/01/2005 | | EXAMINER | |
| TOBY H KUSMER MCDERMOTT WILL & EMERY 28 STATE STREET BOSTON, MA 02109-1775 | | | SPOONER, LAMONT M | |
| | | ART UNIT | PAPER NUMBER | |
| | | 2654 | | |

DATE MAILED: 03/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/841,698 | TROYANOVA ET AL. | |
| | Examiner | Art Unit | |
| | Lamont M Spooner | 2654 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on _____.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-24 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 1-24 is/are rejected.
 7) Claim(s) ____ is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 24 April 2001 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 3/26/2002.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 10 is objected to because of the following informalities:

In claim 10 lines 19, 20, "wherein said wherein said" should be -- wherein said --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 8 recites the limitation "said action dictionary of object synonyms" on page 16, lines 8, 9. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites the limitation "said action dictionary of object synonyms" on page 18 line 28 and page 19, line 1. There is insufficient antecedent basis for this limitation in the claim.

For purposes of examination the Examiner has interpreted the claim as, -- said dictionary of object synonyms --.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Bhandari et al. (herein referred to as Bhandari, US Patent No. 5,895,464 Apr. 20, 1999).

As per **claims 1 and 11**, Bhandari et al. discloses a computer system for searching a database, comprising:

an input section responsive to user entry of a user query (C.3.lines 26, 27, C.6.lines 43-45, Fig. 5-itemS S29, S30-“INPUT USER QUERY”, “NATURAL LANGUAGE PROCESSING OF QUERY”, Fig. 6- query frame representation);

an expansion section responsive to the input section, for expanding the user query to include synonyms of action words and object words in the user query (C.7.lines 18-26, FIG 6-item S42, “GENERATE EXPANDED QUERY FRAMES”);

a validation section responsive to said expansion section (C.7.lines 12-23-validation and expansion are included in selecting a set of appropriate words), and arranged for interaction with a subject-action-object knowledge database (SAO KB), (C.7.lines 12-23-WordNet-is interpreted to be the SAO KB as WordNet contains fields with subjects, actions and objects, as on-line retrievable organized sets) containing fields with subjects, actions, objects, for selecting only those queries having corresponding expressions in the SAO KB (C.7.lines 12-23-“adding a set of appropriate words”-only the words having the expressions in WordNet are selected, it is inherent in selecting only appropriate expanded words from the SAO KB, words are validated upon selection, and invalidated upon rejection due to inappropriateness).

an output section for transmitting selected queries for searching in the database (C.7.lines 32, 33).

As per **claims 2 and 12**, Bhandari discloses all of the limitations of claim 1, upon which claim 2 depends. Bhandari further discloses:

 said entry section includes an analysis portion for separating actions from objects (C.4.lines 35-46-natural language processing section, Fig. 5 item S30, C.5.-C.6.line 15-the input is subject to Natural Language Processing (NLP) which parses and separates the actions from objects).

As per **claims 3 and 13**, Bhandari discloses all of the limitations of claim 1, upon which claim 3 depends. Bhandari further discloses:

 said expansion section interacts with an action dictionary of synonyms (C.7.lines 12-23-the expansion section utilizes WordNet, thus interacts an action dictionary of synonyms).

As per **claims 4 and 14**, Bhandari discloses all of the limitations of claim 1, upon which claim 4 depends. Bhandari further discloses:

 said validating section includes an output portion for outputting validated results and rejecting non-validated results (C.7.lines 12-15-in determining “appropriate words” the validating section outputs the validated search results, and rejects non-validated results, it is inherent in selecting only appropriate expanded words from the SAO KB, words are validated upon selection, and invalidated upon rejection due to inappropriateness).

As per **claims 5 and 15**, Bhandari discloses all of the limitations of claim 1, upon which claim 5 depends. Bhandari further discloses:

said expansion section interacts with an action dictionary of synonyms (C.7.lines 15-23-WordNet-verb synonym set), said action dictionary of synonyms having:

a list of verbs with similar sense (C.7.lines 22, 23-WordNet);

a list of "verb-noun" expressions synonymous with other verbs (C.7.lines 15-23-

WordNet includes a comprehensive dictionary set of synonymous verb-noun expressions such as, inform-produces the synonym verb noun expression "give information");

a list of "verbsA" including the verbs-perform, carry out, realize, and other verbs with similar sense (C.7.lines 15-23-WordNet is comprehensive, the verbs taken to include: perform, carry out, realize);

a list of "verb-relevant verbal nouns" (C.7.lines 15-23, WordNet is comprehensive, to include "verb-relevant verbal nouns");

a list of "verbsB" including the verbs-produce, create, form, and other verbs with similar sense (C.7.lines 15-23, WordNet-is comprehensive, to include "verbsB-produce, create, form and other verbs with similar sense");

a list of "participle2" words including "verb--relevant participles" (C.7.lines 15-23-WordNet is comprehensive to include "participle2" words including "verb-relevant participles").

As per **claims 6 and 16**, Bhandari discloses all of the limitations of claim 5, upon which claim 6 depends. Bhandari further discloses:

said expansion section includes an action expansion portion responsive to said action dictionary of synonyms and to an action word for forming:

a list of verbs relevant to an action (C.15.lines 17-23-WordNet is comprehensive to inherently include verbs relevant to an action);

a list of "verbsA--verbal noun" expressions relevant to an action (C.7.lines 15-23-WordNet includes a comprehensive dictionary set of synonymous verbal noun expressions);

a list of "verbsB--participle2" expressions relevant to an action (C.7.lines 15-23-WordNet is comprehensive to include "participle2" expressions relevant to an action);

a list of "verb--noun" expressions relevant to an action (C.7.lines 15-23-WordNet includes a comprehensive dictionary set of synonymous verb-noun expressions such as, inform-produces the synonym verb noun expression "give information").

(the expansion section utilizes the entire expansion list of keywords accepted from the comprehensive action dictionary of WordNet, C.7.lines 36-48).

As per **claims 7 and 17**, Bhandari further discloses all of the limitations of claim 1, upon which claim 7 depends. Bhandari further discloses:

said expansion section interacts with a dictionary of object synonyms (C.7.lines 15-23-WordNet-noun synonym set).

As per **claims 8 and 18**, Bhandari discloses all of the limitations of claim 1, upon which claim 8 depends. Bhandari further discloses:

said expansion section interacts with a dictionary of object synonyms (C.7.lines 15-23-WordNet and query expander), said action dictionary of object synonyms containing groups of objects having similar sense (C.7.lines 15-23), and an object expression portion to form lists of expressions synonymous from an object and the

dictionary of objects synonyms (C.7.lines 15-23-WordNet includes a comprehensive list of expressions synonymous from an object and the dictionary of objects synonyms).

As per **claims 9 and 19**, Bhandari discloses all of the limitations of claim 1, upon which claim 9 depends. Bhandari further discloses:

 said validation section includes the fields: subjects, actions, objects, and "main parts of objects" and classifies the query on the basis of the fields in response to the expansion section and in response to the SAO KB (C.7.lines 13-33-validation section, which determines the appropriate words includes the subject, action, object, and "main parts of objects", C.7.lines 25-33-the query is classified based on a role, based on the fields, Fig. 4 item S26-role parser, C.5.-C.6.line 54).

As per **claims 10 and 20**, Bhandari discloses all of the limitations of claim 6, upon which claim 10 depends. Bhandari further discloses:

 wherein said expansion section interacts with a dictionary of object synonyms (C.7.lines 13-17), said action dictionary of object synonyms containing groups of objects having similar sense and an object expression portion to form lists of expressions synonymous from an object and the dictionary of objects synonyms (C.7.lines 13-23), and said validation section includes the fields: subjects, actions, objects, and "main parts of objects" and classifies the query on the basis of the fields in response to the expansion section and in response to the SAO KB (C.7.lines 13-33-validation section, which determines the appropriate words includes the subject, action, object, and "main parts of objects", C.7.lines 25-33-the query is classified based on a role, based on the fields, Fig. 4 item S26-role parser, C.5.-C.6.line 54).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhandari et al in view of Rohra Suda et al. (herein after referred to as Rohra Suda, US Patent No. 5,282,265 Jan. 25, 1994).

8. Bhandari and Rohra Suda are analogous art in that they both involve language processing including search and retrieval of information.

As per **claim 21**, Bhandari discloses all of the limitations of claim 1, upon which claim 21 depends, but lacks wherein said SAO KB contains data prepared from texts in a discipline corresponding to the discipline of the query.

However, Rohra Suda et al. teaches having a knowledge base which contains data prepared from texts in a discipline corresponding to the discipline of the query (C.5.line 63-C.6.line 13). Therefore, at the time of the invention, it would have been obvious to one ordinarily skilled in the art to Bhandari with Rohra Suda by including a domain within a knowledge base. The motivation for doing so would have been to retrieve an appropriate plan for generating a related query search with respect to the query domain (C.6.lines 15-19).

As per **claim 22**, Bhandari discloses all of the limitations of claim 1, upon which claim 22 depends, but lacks wherein said SAO contains data prepared from texts in a

discipline corresponding to the discipline of the query. However, Rohra Suda teaches said SAO contains data prepared from texts in a discipline corresponding to the discipline of the query (C.5.line 63-C.6 line 13). Therefore, at the time of the invention, it would have been obvious to one ordinarily skilled in the art to Bhandari with Rohra Suda by including a domain within a knowledge base. The motivation for doing so would have been to retrieve an appropriate plan for generating a related query search with respect to the query domain (C.6.lines 15-19).

As per **claim 23**, Bhandari discloses all of the limitations of claim 1, upon which claim 23 depends, but lacks wherein said SAO KB contains only data prepared from texts in a discipline corresponding to the discipline of the query.

However, Rohra Suda et al. teaches having a knowledge base which contains only data prepared from texts in a discipline corresponding to the discipline of the query (C.5.line 63-C.6.line 13, Fig. 12A). Therefore, at the time of the invention, it would have been obvious to one ordinarily skilled in the art to Bhandari with Rohra Suda by including a domain within a knowledge base. The motivation for doing so would have been to retrieve an appropriate plan for generating a related query search with respect to the query domain (C.6.lines 15-19).

As per **claim 24**, Bhandari discloses all of the limitations of claim 1, upon which claim 24 depends, but lacks wherein said SAO contains only data prepared from texts in a discipline corresponding to the discipline of the query.

However, Rohra Suda teaches said SAO contains only data prepared from texts in a discipline corresponding to the discipline of the query (C.5.line 63-C.6 line 13, 42-

64). Therefore, at the time of the invention, it would have been obvious to one ordinarily skilled in the art to Bhandari with Rohra Suda by including a domain within a knowledge base. The motivation for doing so would have been to retrieve an appropriate plan for generating a related query search with respect to the query domain (C.6.lines 15-19).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Goldberg et al. (US Patent No. 5,895,466 Apr. 20, 1999) teaches searching knowledge base based on parameters extracted from a query, including a subject, object, and action.
- DiDomizio et al. (US Patent No. 6,523,028 filed Dec. 2, 1999) teaches having an expansion section for expanding a user query to include synonyms of action words and object words, a validation section responsive to said expansion section, and arranged for interaction with a knowledge base containing fields with subjects, actions objects, for selecting only queries having corresponding expressions in the knowledge base, and an output section for transmitting the selected queries for searching in the data base.
- Nordstrom (US Patent No. 6,269,329 Filed Nov. 10, 1997) teaches having for an input, including a generated synonymous alternative content related communication constrained to only data generated from information within a discipline, a validation section responsive to an expansion section, and

arranged for interaction with a knowledge base, for selecting/outputting only information having corresponding expressions in the knowledge base.

- Messerly et al. (US Patent No. 6,161,084 filed Aug. 3, 1999) teaches expanding a user query to include synonyms of action words and object words used in the query, a validation section which selects only those queries which have a corresponding expressions in a subject, action, object (SAO) knowledgebase, an analysis portion for separating actions from objects, and rejecting non validated results.
- Klavans et al., Role of Verbs in Document Analysis (Aug. 1998) teaches having WordNet provide a synonym set including an expression list synonymous with from an object and dictionary of objects synonyms.
- Miller et al., Introduction to WordNet: An On-line Lexical Database (Aug. 1993) teaches having fields containing subjects, actions and objects, and synonymous expressions of objects, including a comprehensive action dictionary of synonyms.
- Mihalcea et al., A Method for Word Sense Disambiguation of Unrestricted Text (Jun. 1999) teaches generating a sense tagged verb-noun pair utilizing WordNet.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lamont M Spooner whose telephone number is 703/305-8661. The examiner can normally be reached on 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on 703/305-9645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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SUPERVISORY PATENT EXAMINER